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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,735	03/25/2004	Jick M. Yu	42P6934D	9698
8791	7590	03/08/2006	EXAMINER MAI, ANH D	
BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD SEVENTH FLOOR LOS ANGELES, CA 90025-1030			ART UNIT 2814	PAPER NUMBER

DATE MAILED: 03/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/810,735

Applicant(s)

YU, JICK M.

Examiner

Anh D. Mai

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 17, 2006 has been entered.

Status of the Claims

2. Amendment filed February 17, 2006 has been entered. Claims 31, 32, 40-42 and 47-49 have been amended. Claims 52-54 have been added. Claims 31-54 are pending.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “one or more annealing chambers” must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must

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be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 32, 41, 42, 48 and 49 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

With respect to claims 32, 42 and 49, the limitations of these claims have already existed in claims 31, 40 and 47 respectively, thus fails to further limit the claims that they depend on.

With respect to claim 41 and 48, since the function of the robot is to move wafers from one chamber to another chamber, therefore by claiming the robot to move wafers from another chamber to one chamber does not further limit the functionality of the robot, thus fails to further limit the claims 40 or 47, respectively.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 52-54 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The terms “does not have a polishing chamber” (claim 52) and “does not have a metal deposition chamber” (claims 53 and 54) are **negative** limitation that rendered the claim indefinite because it was an attempt to claim the invention by excluding what the inventor *did not invent* rather than distinctly and particularly pointing out what they did invent. See *In re Schechter*, 205 F.2d 185, 98 USPQ 144 (CCPA 1953). (See MPEP 2173.05(i)). Any negative limitation or exclusionary proviso *must have* basis in the original disclosure. See *In re Johnson*, 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 31-38, 52, 40-45, 53, 47-51 and 54 are rejected under 35 U.S.C. 102(e) as being anticipated by Henley et al. (U.S. Patent No. 6,207,005) of record.

With respect to claim 31, insofar as the apparatus is concerned, Henley teaches a wafer processing **apparatus** as claimed including:

a plurality of chemical vapor deposition (CVD) chambers; (col. 11, lines 20-29);
one or more annealing chambers (col. 10, line 65-col. 11, line 19), the one or more annealing chambers integrated with the wafer processing apparatus; (10, 200, 300);
a robot (20) (col. 4, lines 18-21). (See Figs. 1-3).

Regarding the terms: “the chemical vapor deposition chambers to deposit metal layers on wafers by chemical vapor deposition”; “the one or more annealing chambers to anneal the metal layers to stabilize hardness of the metal layers prior to chemical mechanical polishing” and “robot to move the wafers having the metal layers deposited thereon from the chemical vapor deposition chambers directly to the one or more annealing chambers shortly after the metal layers have been deposited on the wafers”, these terms are considered to be functionalities or utilities of the components of a cluster tool.

Since the apparatus of Henley comprises all components (CVD chamber, annealing chamber and robot) of the claim, thus the apparatus of Henley is capable to perform the functions or utilities as claimed, thus, the limitations of the claim are met.

Regarding the capability of the robot 20, since all the chambers of the cluster tool (10, 200, 300) are directly connected to the central wafer transfer chamber, therefore, the robot 20 is fully capable of transferring a wafer directly from one chamber to the other, prior to or shortly after a process has been completed depend upon the application.

With respect to claim 32, the wafer processing apparatus of Henley consists essentially of the plurality of chemical vapor deposition chambers, the one or more annealing chambers, and the robot.

With respect to claim 33, the one or more annealing chambers of Henley are attached to the side of the wafer processing apparatus.

With respect to claim 34, the one or more annealing chambers of Henley are provided adjacent to the wafer processing apparatus and its CVD chambers.

With respect to claim 35, Henley teaches that the apparatus is used for the deposition of a conductive film, as disclosed in col. 11, lines 27-29 and even further that the apparatus can be used to deposit copper, as disclosed in col. 11, lines 34-38, but more importantly the structure is taught by Henley as applied above, and it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F.2d 1647 (1987).

With respect to claims 36-38, the annealing chamber of Henley comprises a furnace, a heat lamp or a hot stage. (See col. 13, line 46-58).

With respect to claim 52, as best understood by the examiner, Henley teaches that the exact configuration of chambers used in the cluster tool depend upon the application, thus, the cluster tool of Henley can be used with or without a polishing chamber.

With respect to claim 40, insofar as the apparatus is concerned, Henley teaches a wafer processing apparatus as claimed including:

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one or more annealing chambers (col. 10, line 65-col. 11, line 19), the one or more annealing chambers integrated with the wafer processing apparatus (10, 200, 300);

one or more chemical mechanical polishing (CMP) platforms (305), the one or more (CMP) platforms integrated with the wafer processing apparatus;

a robot (20). (See Figs. 1-3).

Regarding the terms: “the one or more annealing chambers *to anneal* wafer having metal layers thereon to stabilize hardness of the metal layers prior to chemical mechanical polishing”; “the one or more chemical mechanical polishing platforms *to polish* the wafers including the metal layers” and “robot *to move* the wafers having the metal layers deposited thereon from the one or more annealing chamber directly to the one or more chemical mechanical polishing platforms”, these terms are considered to be the functionalities or utilities of each components of a cluster tool.

Since the apparatus of Henley comprises all components (annealing chamber, CMP platform and robot) of the claim, thus the apparatus of Henley is capable to perform the utilities as claimed, thus, the limitations of the claim are met.

Regarding the capability of the robot 20, since all the chambers of the cluster tool (10, 200, 300) are directly connected to the central wafer transfer chamber, therefore, the robot 20 is fully capable of transferring a wafer directly from one chamber to the other, prior to or shortly after a process has been completed depend upon the application.

With respect to claim 41, as discussed above, the robot (20) of Henley is fully capable of moving the wafers from one chamber to another chamber depend upon the application.

With respect to claim 42, the wafer processing apparatus of Henley consists essentially of the one or more annealing chambers, the one or more chemical mechanical polishing platforms, and the robot.

With respect to claim 43, the one or more annealing chambers of Henley are attached to the side of the wafer processing apparatus.

With respect to claim 44, the one or more annealing chambers of Henley are provided adjacent to the wafer processing apparatus and one or more CMP platforms.

With respect to claim 45, the annealing chamber of Henley comprises one or more selected from a furnace, a heat lamp and a hot stage. (See col. 13, line 46-58).

With respect to claim 53, as best understood by the examiner, Henley teaches that the exact configuration of chambers used in the cluster tool depend upon the application, thus, the cluster tool of Henley can be used with or without a metal deposition chamber.

With respect to claim 47, insofar as the apparatus is concerned, Henley teaches a wafer processing apparatus as claimed including:

one or more chemical mechanical polishing (CMP) platforms (305), the one or more CMP platforms integrated with the wafer processing apparatus;

one or more annealing chambers (col. 10, line 65-col. 11, line 19), the one or more annealing chambers integrated with the wafer processing apparatus;

a robot (20). (See Figs. 1-3).

Regarding the terms: “the one or more chemical mechanical polishing platforms *to polish* the wafers having metal layers thereon”; “the one or more annealing chambers *to anneal* wafer having metal layers thereon to stabilize hardness of the metal layers after the wafers have been polished”; and “robot *to move* the wafers that have been polished from the one or more chemical mechanical polishing platforms directly to the one or more annealing chambers”, these terms are considered to be the functionalities or utilities of each components of the cluster tool.

Since the apparatus of Henley comprises all components (CMP platforms, annealing chamber and robot) of the claim, thus the apparatus of Henley is capable to perform the functions or utilities as claimed, thus, the limitations of the claim are met.

Regarding the capability of the robot 20, since all the chambers of the cluster tool (10, 200, 300) are directly connected to the central wafer transfer chamber, therefore, the robot 20 is fully capable of transferring a wafer directly from one chamber to the other, prior to or shortly after a process has been completed depend upon the application.

With respect to claim 48, as discussed above, the robot (20) of Henley is fully capable of moving the wafers from one chamber to another chamber depend upon the application.

With respect to claim 49, the wafer processing apparatus of Henley consists essentially of the one or more annealing chambers, the one or more CMP platforms and the robot.

With respect to claim 50, the one or more annealing chambers of Henley are attached to the side of the wafer processing apparatus.

With respect to claim 51, the one or more annealing chambers of Henley are provided adjacent to the wafer processing apparatus and one or more CMP platforms.

With respect to claim 54, as best understood by the examiner, Henley teaches that the exact configuration of chambers used in the cluster tool depend upon the application, thus, the cluster tool of Henley can be used with or without a metal deposition chamber.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 39 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henley '005.

Henley teaches (col. 13, lines 58-64) that the annealing chamber can heat the wafer to a temperature of about 450 °C or greater.

Note that, the limitation of the claims are the one or more annealing chamber are to heat to a temperature of about 200 °C.

the specification contains no disclosure of either the *critical nature of the claimed temperature of 200 °C* of any unexpected results arising therefrom. Where patentability is aid to based upon particular chosen dimension or upon another variable recited in a claim, the Applicant must show that the chosen dimension are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

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Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to was made to heat the wafer to the temperature (as claimed) depend upon the application since the annealing chamber of Henley is fully capable of heating to 450 °C or greater.

Response to Arguments

8. Applicant's arguments filed February 17, 2006 have been fully considered but they are not persuasive.

The instant claims are direct to a **wafer processing apparatus**. However, Applicant's arguments are directed to the *method of operating cluster tool*, therefore, the arguments are deem irrelevant to the apparatus claims.

For the sake of argument, the apparatus of Henley clearly shows that all components of the cluster tool are directly attached to the processing chamber, which includes robot 20. Therefore, the wafers are moving from one chamber to another chamber by robot 20 are determined to be a direct movement, depend upon the application.

Again, Applicant arguments are more suit to method claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh D. Mai whose telephone number is (571) 272-1710. The examiner can normally be reached on 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



ANH D. MAI
PRIMARY EXAMINER